




**CISSL** Guided Inquiry 

**Evidence-based practice and charting the learning outcomes: overview of research and strategies**


**Evidence-Based Practice (EBP)**




**CISSL** Evidence Based Practice 

**If your principal asked “How do all of these research assignments help students learn content and do well on tests?”**

**What would you answer?**

**CISSL** Two key dimensions of EBP in current usage 


1. Conscientious, explicit and judicious use of current best research findings in making decisions about the performance of the day-to-day role
2. Where day-to-day professional work is directed towards demonstrating the tangible impacts and outcomes of sound decision making and implementation of organizational goals and objectives.
  - Local actions, local processes, and local, immediate outcomes


**CISSL** Evidence-Based Practice 

**Gathering evidence in YOUR local school**  
You are able to provide convincing evidence that answers this question:

**“What are the differences, the tangible learning outcomes and learning benefits of my school library based research projects”?**

**How does Guided Inquiry help students meet the Standards?**

**CISSL** EVIDENCE 



**“Don’t tell me what you believe. Show me what you do, and I will tell you where your priorities are”**

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Library Approach

- Number of classes in the library
- Number of library items borrowed
- Number of students using the library at lunch times
- Number of items purchased annually
- Number of web searches
- Number of books lost
- Students suffering from PFS and LHC

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Learning Approach

Understanding how school libraries help kids learn: Learning outcomes in terms of:

- Knowledge outcomes – mastery of content
- Information processes
- Information technology
- Independent learning
- Attitudes and values of information, learning
- Self concept and personal agency

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**Evidence-Based Practice**  
is about celebrating the  
understood, not the  
found

(Knowledge, not Information)

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Typical Outcomes  
Approaches

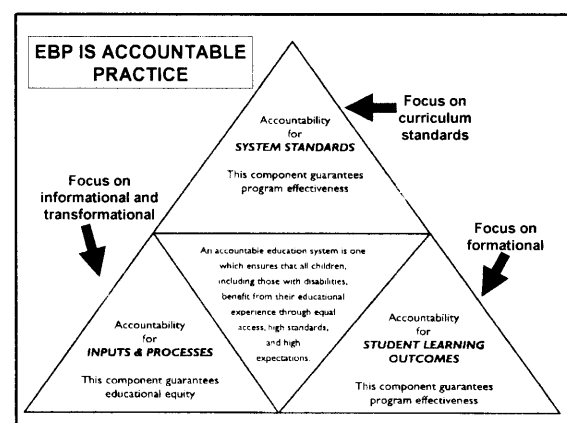
Use of informal observational approaches rather than the use of planned strategies for recoding evidence: based on unsystematic observations and gut reactions


- *"I rely on my long experience to work out what is happening with the students";*
- *"I watch the students casually while they work in the library";*
- *"I get ideas from the kinds of questions students ask";*
- *"I will ask students about what they have learned in the library";*
- *"I have discussions with teacher / school librarian about what is going on"*
- *"I take note of student behaviors while they are in the library"*

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Evidence Approach


- Identifying indicators and outcomes of learning: declarative knowledge & procedural knowledge
- Systematically locating evidence
- Analyzing and organizing evidence
- Summarizing evidence
- Presenting evidence
- Celebrating achievements
- Reflecting on evidence to reshape practice



**CISSL** Evidence of Knowledge Construction 

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- Intellectual Quality
  - Deep knowledge
  - Deep understanding
  - Problematic knowledge
  - Higher order thinking
  - Meta-language
  - Substantive communication


**CISSL** Deep knowledge: 

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- Knowledge is deep when focus is sustained on key concepts and ideas

Evidence:

- Sustained focus on specific topic
- Explanatory detail
- Knowledge of hierarchical and associative relationships


**CISSL** Deep understanding: 

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- Students are able to demonstrate meaningful understanding of the central ideas and the relationships between them

Evidence:

- Organized, structured sequence of ideas
- Appropriate recall
- Diversity of viewpoints / positions
- Presentation and discussion


**CISSL** Problematic knowledge: 

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- Students can address multiple perspectives and/or solutions and to recognise that knowledge is constructed

Evidence:

- Students understand the various arguments, evidences, counterarguments
- Acknowledge conflicts in information


**CISSL** Higher-order thinking: 

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- Students are engaged in thinking that requires them to organise, reorganise, apply, analyse, synthesise and evaluate knowledge and information

Evidence:

- Students use information from more than one web site, compare it, select the best to use for the purpose, decide what is relevant for each aspect of task

**CISSL** Meta-language: 

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- Students explicitly name and analyse knowledge as a specialist language

Evidence:

- students use complex terms relevant to their subject
- students learn to search relevant databases using complex language

**CISSL** **Substantive communication:**

Students engage in sustained conversations about the concepts and ideas – can manifest in oral, written, artistic forms

**Evidence:**

- Increased confidence in presentations
- Increased quality of classroom discussion after library visits
- Increase in quality and frequency of questions about research topics
- Increased retention of content which is utilized in later discussions

**CISSL** **Significance**

- Students see why and understand that their learning matters and has real world connections
- Able to transfer key ideas to other contexts and situations
- Explain importance / significance

**CISSL** **Communicating the Learning Outcomes**

How might you communicate the learning outcomes of your team efforts?

**CISSL** **A knowledge-Sharing Community**

- Summary of projects in School Newsletter to parents
- Staff, Curriculum and parent meeting – learning outcomes focus
- Photo and commentary of teaching units on school web, including student feedback of process and learning outcomes
- Student morning tea to discuss learning outcomes with teachers
- Community newspaper stories
- Focus on national and state themes: eg “No Child Left Behind” Legislation

**CISSL** **Setting the Example**


*“I do not let an opportunity go by when I let staff know about what the library contributes to learning. I always quote some of the things the students have said to illustrate my points. The school has got the idea that what I am on about in helping kids learn. The key thing in my view is to have something to say that goes beyond gut reaction. The student survey does just that. ... I believe they listen a great deal to this”.*

**CISSL** **New Jersey Project 2003 - 2005**

- To provide (if any) empirical evidence of the impact of school libraries on student learning, and to use this as a basis for developing a learning impacts measure for use by school-based teams.
- What learning outcomes, aligned to curriculum standards, does the school library enable?
- How might these learning outcomes be identified, measured, and embedded into professional practice?
- Research Component + Development Component

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**Schools Context**



- 10 New Jersey public schools chosen by call for nomination and selected by NJ Expert Panel
- Experienced and expert school librarians
- Diverse schools
- 10 teacher-school librarian teams
- 10 school librarians working on curriculum projects with 17 classroom teachers
- 574 students in Grades 6 – 12
- Data collected over four weeks, Spring 2004
- Inquiry Training Institute Feb 24, 2004: overview and critique of units, use of data collection instruments, procedures and ethical guidelines

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**Inquiry Unit Profile**



School	Grade	No. of Students	No. of Teachers	Project description
1	6	47	2	Social Studies: Ancient civilizations
2	8	72	1	Social Studies - Middle Ages & Renaissance
3	9-10	19	1	Biology - 8 characteristics of life
4	8	63	2	Heritage project
5	9-12	70	3	3 projects Research & Debate - current issues in society, Social studies - UN English - "American Dream" 1920s
6	8	64	3	3 projects ESL - heritage project English - multicultural literature, self choice Biology - repeated same unit as have for several years
7	10	22	2	An accomplished person
8	10	74	1	Chemistry - A chemical component
9	8	64	3	4 projects Humanities - Westward expansion Science - related to Westward English - poetry Language - national anthem
10	7	67	3	Humanities - traditions of another country

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**Data Collection Instruments**




Five data collection instruments were used to collect the data from the students:

- Writing Task 1 (at initiation of inquiry unit)
- Writing Task 2 (at midpoint of inquiry unit)
- Writing Task 3 (at conclusion of inquiry unit)
- Search Journal Log
- My Research Style

The instruments consisted of a combination of qualitative and quantitative questions.

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**Writing Tasks**




Writing task 1 and 2 consisted of the following questions

- Write the title that best describes your research project at this time.
- Take some time to think about your research topic. Now write down what you know about this topic.
- What interests you about this topic?
- How much do you know about this topic? Check (✓) one box that best matches how much you know. Nothing, Not much, Some, Quite a bit and A great deal
- Write down what you think is EASY about researching your topic.
- Write down what you think is DIFFICULT about researching your topic.
- Write down how you are FEELING now about your project. Check (✓) only the boxes that apply to you. Confident, Disappointed, Relieved, Frustrated, Confused, Optimistic, Uncertain, Satisfied, Anxious or Other.

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**Additional Questions at Writing Task 3**



- Write down what you think is EASY about researching your topic.
- Write down what you think is DIFFICULT about researching your topic.
- What did you learn in doing this research project? (This might be about your topic, or new things you can do, or learn about yourself)
- How did the SCHOOL LIBRARIAN help you?
- How did the TEACHER help you?

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**Changes in Knowledge: 5 Approaches to Measurement**



- Substance of knowledge. Analysis of changes in the relational nature of statements by which students described their topical knowledge.
- Amount of knowledge. Numerical count of number of statements they used to describe their topical knowledge, as well as isolated concepts / terms.
- Structure of knowledge. Thematic organization and integration of themes into a meaningful structure
- Estimate of knowledge. Personal estimate of extent of their topical knowledge
- Labeling of knowledge. The students were asked to give a title for their inquiry project, which was considered to reflect the degree of focus/specification of topical knowledge.

**CISSL** Substance of knowledge

Classification of Statements: based on nature of relationships between concepts

Graesser & Clark (1985) *Structures and procedures of implicit knowledge*. Norwood, N.J.: Ablex.

- Properties: statements describing characteristics
- Manner: statements describing processes, styles, actions
- Reason: statements of explanations of how and why
- Outcome: statements providing end result
- Causality: statements showing some event causally leads to another
- Set Membership: statements about class inclusion
- Implication: statements showing predictive relations, inference, implied meaning
- Value judgment: statements presenting personal position or viewpoint

**CISSL** Classification of Statements

- Properties: The color of Valentine's day is red
- Manner: People drive aggressively in USA
- Reason: The wall was constructed to block invaders (People eat too much) As a result, people got very sick
- Outcome: Acid rain causes many fish to die
- Causality: Michelangelo created works such as statue of David, Cistine Chapel and the famous Pieta
- Set Membership: He was suspected of poisoning him
- Implication: That's not right
- Value judgment: That's not right

FACTS: property, manner, set membership  
EXPLANATION AND RESULTS: Reason, outcome, causality  
SYNTHESIS: conclusions, positions, viewpoints

**CISSL** Coding of Structure of Knowledge

Ideas are discrete and unrelated.

Some -meaning more than one instantiation- some ideas are joined or linked (grouped) while others are discrete or unrelated.

Contiguous ideas are associated; set of ideas may be somewhat continuous.

Overall, ideas are interrelated and continuous.

Ideas are integrated and unified; there is structural centrality.

**CISSL** Changes in Knowledge

Moving Vertically or Horizontally on the Information Sea

**CISSL** Going Deep or Skimming the Surface

HORIZONTAL	VERTICAL
<ul style="list-style-type: none"> <li>• Gathering facts</li> <li>• Gathering more facts</li> <li>• Gathering even more facts</li> </ul>	<ul style="list-style-type: none"> <li>• Gathering facts</li> <li>• Manipulating these facts in a number of ways: seeking explanations, synthesizing facts into more abstract groupings, organizing facts in more coherent ways; reflecting on these facts to draw out conclusions and build positional or predictive statements</li> </ul>
<ul style="list-style-type: none"> <li>• Student learning seems to remain on a more descriptive level throughout the project. Their topical understanding develops through addition of new detail.</li> </ul>	
<ul style="list-style-type: none"> <li>• INFORMATION LITERACY FOCUS ON FINDING INFORMATION</li> </ul>	<ul style="list-style-type: none"> <li>• INFORMATION LITERACY FOCUS ON BUILDING KNOWLEDGE</li> </ul>

**CISSL** Immune reactions

WT1: It probably has most to do with how the body reacts to certain problems in the body. Like how a body reacts to a sneeze or a cough.

WT2: The immune system is what protects you, anybody, from various outside bacteria, viruses, and germs. ....The immune has I-cells and other types of cells that help fight the.....When you cut yourself you can see the immune system at work because you can see the cells that are rebuilding the tissues that were cut.....(long reply)

WT3: (very long reply) The immune system was a big topic. I found out that there is actually two types of immune systems in the body. ....I learned that if a bacteria enter your body, it could enter a cell, replicate in a manner of minutes and if there are.....So you could have millions of bacteria in the body after an hour.....the body works against such organ degradation, mineral deficiency, mechanical damage and other. What I really enjoy to learn was that the minute you are born....and when you die your immune system shuts down letting in all the bad stuff, so now the body is an open door....

**CISSL** **Gay Marriage**

WT1: *I know that the major in San Fransisco was performing gay marriages. (reply in total)*

WT2: *I know that right now only a few states are allowing homosexuals to get married. I know Massachusetts was the first state to.....4000 marriages were carried out in San Francisco in February.....President Bush strongly against.....(long reply)*

WT3: *Homosexuals are being discriminated, being denied their rights.*

**CISSL** **Horizontal**

WT1: *He is very famous for his plays .....(100, 285001)*

WT2: *He married Anne Hathaway. They had 3 children. ....He wrote 37 plays and 152 sonets. .... (100, 285001)*

WT3: *He was born on April 23, 1564 in Warichshire, Stratford-upon-Avon, Britain.....Married at age 18. Had three children; Judith, Hammet and Susana. He was the first boy in the family, had 3 sister and 1 brother, Joan, Margaret, Gilbert sibling.(100, 285001)*

**CISSL** **Adrenaline**

WT1: *It is a natural rush in your body. It can occur from excitement, nervousness, or fear. Can enable a mother to lift a car off her child – a strong rush of energy strength or feeling.*

WT2: *C9H13NO3. It is a compound that is stimulated by a feeling of fear, excitement or nervousness. It effects nerve and muscle functions and effects circulatory system and heart rate. It can be used in astma inhalers to relax outbursts and attacks. Also called epinephrine.*

WT3: *Adrenaline or epinephrine is a hormone. It's compound is C9H13NO3. It froms clear to white crystals and is effected by light and dark. It is created in the medulla.....from the hypothalamus part of the brain. It is known as the "fight or flight" response that prepares your body for a big mental or physical act. It effects normal muscle use, lungs .....It is used in asthma inhalers, operations to prevent bleeding and used in cardiac arrest injections.*

**CISSL** **The influence of approach to studying**

- The students with a deep study approach presented themselves as knowledgeable about their topics at the final writing task.
- Typically deep students demonstrated their knowledge change by synthesized replies
- The dominating "deep" feelings seemed to be confidence and optimism throughout the process. They scored higher than average on these emotions.
- They also seemed more relieved and satisfied with the probably successful inquiry process than students on average.
- Most of the students with a deep study approach had a specific interest for their topics, and interest was a key basis for in learning more about the topic
- Deep learners: own eagerness to learn -> run the risk of becoming particularly vulnerable to information overload
- students with a deep approach indicated strong awareness of information quality. Appeared driven to explore a wide variety of material for their inquiry project and encounter material of various quality.

**CISSL** **students with the most surface study approach**


- Their knowledge seemed to remain on a rather factual level throughout their projects.
- Their own estimates of knowledge did not either change as much as on average, but rather remained on similar levels throughout the project.
- Little increase in level of their topical knowledge.
- The aspect of the search process that these students predominantly mentioned as easy was availability of information.
- fact-finding approach where information seeking foremost is seen as a process of collecting facts.
- The students with a surface study approach seemed particularly relieved when the projects ended.
- Low levels of interest and engagement.

**CISSL** **What learnings took place?**

- Increase in knowledge about a topic
- Development of research skills, especially "combining" information
- Skills in using specific online sources (online databases, Internet, OPACs)
- Widened information horizon and changed conceptions of information seeking – "The Transformed Googliers" – recognition of beneficial information sources beyond Google
- More realistic conceptions of efficient information seeking
- Heightened awareness of quality aspects of information
- Dealing with information conflict

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**Differences**



- Yes there were variations in the schools.
- Changes in knowledge (knowledge growth) did not occur evenly in the schools
- No significant variations across the age, grade, and gender groups; the disciplinary field does not seem to be an explanatory factor

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**Factors contributing to differences across Schools**



- Nature of task: imposed task or negotiated task
- Engagement and ownership
- Nature of Interventions: Development of skills to construct knowledge rather than finding information


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**Guided Inquiry**



**School Library Impact Measure**

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**“If we always see as we’ve always seen,  
 We’ll always be as we’ve always been,  
 We’ll always do as we’ve always done,  
 And we’ll always get what we’ve always got”**

(Author unknown)



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**Discussion**